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ABSTRACT

This study examined the effectiveness of using selected self-report measures assessing motivational orientation, learning strategies, procrastination, and perceptions of daily hassles to facilitate the prediction of student engagement in a self-paced introductory psychology course. Research has shown these factors to be associated with academic success. Four surveys purporting to measure the constructs were chosen, and a demographic survey was also administered. The course used a local area network of personal computers to administer all materials and to collect relevant data for each participant. Students agreeing to participate were administered the surveys during the first three class sessions of the semester. The course was self-paced, with students determining their rate of engagement. A criterion level of accumulated points determined course letter grade and course completion. Data were collected on 149 students, 122 of whom completed the course. For students completing the course, engagement was determined relevant to the number of days to course completion. A median-split was used to determine early finish versus late finish groups. Nonfinishers made up a third group. Discriminant function analysis to discover and interpret combinations of predictors determined that group membership could be predicted reliably. Implications for using these surveys to predict student engagement, as well as instructor intervention, are discussed. (Contains 2 tables and 110 references.) (Author/SLD)

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Predicting Student Performance in a College Self-Paced Introductory Psychology Course: The Role of Motivational Orientation, Learning Strategies, Procrastination and Perception of Daily Hassles

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Abstract

This study examined the effectiveness of using selected self-report measures assessing motivational orientation, learning strategies, procrastination, and perceptions of daily hassles to facilitate the prediction of student engagement in a self-paced introductory psychology course. Research has shown these factors to be associated with academic success, and of concern to instructors and students alike. Surveys that economically and effectively assess these factors would be invaluable for the instructor attempting to predict student engagement and determining possible interventions to promote academic success. Four surveys purporting to measure the constructs were chosen. A demographic survey was also administered.

The course utilized a local area network of personal computers to administer all materials and to collect relevant data for each participant. Students agreeing to participate in the study were administered the surveys during the first three class sessions of the semester. The course was self-paced, with students determining their rate of engagement. A criterion level of accumulated points determined course letter grade and course completion. Data was collected on a 149 students, 122 of whom completed the course.

For students completing the course, engagement was determined relevant to the number of days to course completion. A median-split was used to determine early finish vs. late finish groups. Non-finishers comprised the third group. Discriminant function analysis to discover and interpret combinations of predictors determined that group membership could be reliably predicted. Implications for using these surveys to predict student engagement, as well as instructor intervention, are discussed.

Predicting Student Performance in a College Self-Paced Introductory Psychology Course: The Role of Motivational Orientation, Learning Strategies, Procrastination and Perception of Daily Hassles

Introduction

For faculty of colleges and universities, student success is a major concern. Student success and achievement is often perceived as being indicative of overall institutional success or failure, and may impact administrative decision-making in several areas (e.g., faculty / administrative accountability, salary, tenure, promotion, student recruitment, state and federal funding, budgetary considerations). The academic success or failure of individual students is foundational to these issues and, therefore, identifying salient factors that impact student academic success and decision-making is of profound importance (Entwistle, 1995; Snow, 1993).

Research within a sociological paradigm has shown that various factors differentially affect an individual's feelings, cognitions, and resultant decisions with regard to the college student experience. These include but are not limited to perceptions of financial abilities, familial responsibilities, and initial intentions to remain at an institution of initial choice (Terenzini, Pascarella, & Lorang, 1982; Terenzini, et al., 1993). Ethnic identification, secondary school achievement, parental encouragement for college, family economic status, and the student's appraisals and interpretations of the academic and social communities of the university or college of choice have also been suggested (Tinto (1975, 1986a, 1986b). They affect the degree to which individuals perceive that they are integrated into the academic and social networks of the institution (Tinto, 1993), and therefore, influence a student's persistence decisions and academic success. Seppanen (1995) states that successful adaptation to the college experience, both academically and socially, is inferred by the student's persistence toward the goal of graduation.

In addition to these sociological influences, researchers have identified various factors affecting academic performance that are more proximal to the student. Of particular interest are: (a) motivation, (Pintrich & Schunk, 1996), (b) the use of learning strategies (e.g., Ridley, Shultz, Glanz, & Weinstein, 1991), (c) procrastination (e.g., Lay,

1986) and, (d) the occurrence and perception of hassles (e.g., Kanner, Coyne, Schaefer, & Lazarus, 1981). Although research has shown these to be related to various measures of academic performance and achievement, their ability to predict student engagement and performance has not been investigated. The major purpose of this study was to investigate the relationships of these specific cognitive, behavioral, and affective factors and the predictive ability of specific assessments to predict student performance and engagement in a college introductory psychology course.

Theoretical Foundations

Human adaptivity entails the effective and efficient utilization of basic capacities (Bandura, 1986). In addition, an individual's perceptions and cognitions regarding past and present experiences, as well as their expectations of future success, influence functionality (Bandura, 1986). Of great interest to university personnel, particularly administration and faculty, is the effective identification and assessment of factors associated with success for college students (e.g., Tisdelle & St. Lawrence, 1986). These factors would include those that influence student decisions regarding persistence (Stoynoff, 1997; Terenzini et al., 1982), as well as differences in personal problem-solving ability and environmental circumstances (Flett & Johnson, 1992).

Tisdelle and St. Lawrence (1986) suggest that the assessment of behavioral change and problem solving ability must include the identification of social situations that present difficulties to the individual. Interpersonal problems that involve academic and financial matters (Gong-Guy & Hammen, 1980; Hammen, Krantz, & Cochran, 1981), and emotional problems involving feelings of sadness, worthlessness, and anxiety (Flett & Johnson, 1992), are those most frequently reported by college students. Research indicates that differences in the type of personal problem that an individual faces may affect academic and social problem solving (Heppner, Hibel, Neal, Weinstein, & Rabinowitz, 1982). In addition, behaviors that inhibit learning and effective performance, such as procrastination (e.g., Solomon & Rothblum, 1984) and the use of ineffective learning strategies (e.g., Weinstein & Mayer, 1985), should also be considered.

Therefore, it is prudent to consider multiple perspectives when attempting the identification relevant and classification of relevant factors associate with academic performance and achievement. For the purpose of this study, three perspectives were considered. These were: (a) a sociological perspective, (b) adult education, and (c) social cognitive theory.

Sociological Perspectives

Qualitative research within a sociological paradigm has shown that various factors, both endogenous and exogenous, differentially influence an individual's feelings, cognitions, and resultant decisions with regard to the college student experience (Terenzini et al., 1982; Terenzini, et al., 1993). These include, but are not limited to, perceptions of financial responsibilities, familial responsibilities, and initial intentions to remain at an institution. Tinto (1975, 1986a, 1986b) also suggested that ethnic identification, secondary school achievement, parental encouragement for college, family socioeconomic status, and the student's appraisals and interpretations of the academic and social communities of the university of choice are relevant factors. They affect the degree to which individuals perceive that they are integrated into the academic and social networks of the institution (Tinto, 1993), and therefore, are factors influencing the student's academic success, as well as their persistence decisions. For Seppanen (1995), successful adaptation to the college experience, both academically and socially is inferred by the student's persistence toward the goal of graduation.

Adult Education

Conceptual insight into the identification and categorization of factors associated with academic performance and engagement, as well as the complex relationships among them, can also be found in the adult education literature. Cookson (1986), adapting the work on social participation of Smith and Reddy (1972), proposed a comprehensive multidimensional model describing adult education participation. The author, assuming that human behavior is "predictable or determined by certain identifiable and measurable aspects of both the person and the environment" (p.130), suggests a sequential model of adult education participation (AEP) which incorporates the independent variables of: (a)

external context, (b) social background, (c) personality and intellectual capacity factors, (d) attitudinal dispositions, (e) retained information, and (f) situational variables.

The models suggested by Tinto (1975) and Cookson (1986) serve as frameworks for the identification and classification of factors that would seem to influence successful engagement and participation in the college experience from a sociological perspective and from the adult education literature.They depict the social network that impacts student decision-making but suggest a more or less cumulative and linear relationship between these factors. There is minimal consideration for the identification and the interrelationships among personal and situational factors that proximally affect student performance in a single course. The models do, however, suggest that such factors could be broadly conceptualized as (a) academic (e.g., learning strategies) and social skills; (b) motivation and cognitions (e.g., attitudes, dispositions, beliefs) with regard to individual academic and social self-concept, the situational context, and familial and institutional commitments; and (c) demographic variables (e.g., age, sex, high school grade point average).

Social Cognitive Theory

In order to facilitate understanding of individual human functionality in context, it is necessary to consider the proximal social, personal and cognitive, and situational influences, as well as the complex interrelationships among these factors. The premises of social cognitive theory (e.g., Bandura, 1986) would seem most effective in this regard.

Social cognitive theory emphasizes the role of social experiences of the individual, and the interpretation of these experiences, as the foundational influences effecting human functioning and adaptivity (Bandura, 1986; Schunk, 2000: Zimmerman, 1990). The theory also encompasses the acquisition and performance of diverse skills, strategies, and behaviors, including cognitive, social, and self-regulatory skills (Schunk, 2000) that serve to facilitate adaptivity. The acquisition and prosocial behavior and moral development have also been addressed (Schunk, 2000).

For Bandura (1986) and his colleagues, human functioning is most effectively explained in terms of a model of triadic reciprocal causality. An analysis of human motivation, thought, and action emphasizes the causative inter-relationships among three

broad categories of factors. These are conceptualized as being (a) behaviors, (b) cognitions and other personal factors, and (c) environmental events, and are considered as being interacting determinants of each other. Reciprocality among these influences is neither necessarily symmetrical nor bi-directional. Typically only one or two factors predominate, depending upon their relative influence (Pintrich & Schunk, 1996), the specific context, or the dynamic of the behavioral interaction (Zimmerman, 1989).

Learning and performance are considered as being separate, though related, events and processes (Bandura, 1986). Within the social cognitive perspective, learning includes the acquisition and retention of knowledge, rules, social skills, motor performance skills, problem-solving strategies, attitudes, beliefs, and emotions through cognitive processes associated with social interaction (e.g., observation and imitation). These cognitive processes would also include the learner's evaluation of whether or not the behaviors of a model are appropriate given observed consequences. Individuals are thus motivated to act upon their constructed goals, beliefs, and values (Bandura, 1986; Pintrich & Schunk, 1996; Schunk, 2000), with these motivational processes influencing both learning and performance. Therefore, being effective and successful in one's academic and intellectual functioning would require more than the acquisition of factual information and reasoning abilities for given tasks and problems. Self-regulative, social, motivational, and affective factors should also be considered as influential in one's cognitive functioning (Bandura, 1992).

Social cognitive researchers view self-regulation as an acquired achievement of socialization processes, influencing both the environment and various personal processes, such as self-efficacy perceptions (Bandura, 1977; Bandura & Walter, 1963; Zimmerman, 1989, 1990). Of particular interest are the functions of within-person factors (e.g., cognitions, beliefs, emotions) in human adaptivity. The individual is considered to be an active processor of information that is mediated by their cognitions and beliefs (Pintrich, Smith, Garcia, & McKeachie, 1993). The theoretical principles of reciprocal determinism suggest that the within-person interactions among beliefs, cognitions, and emotions affect and mediate behaviors and the interpretation of environmental cues, and thus, influence behavior (Bruing, Schraw, & Ronning, 1999: Pintrich & Schunk, 1996; Zimmerman, 1989). One's capacity to reflect on perceived capabilities and resultant conceptions of

competence to achieve explicit goals (i.e., self-efficacy), also influences thought and action. The individual performs based on their interpretations of cognitions and beliefs, which also manifest associated emotions. Conceptions of self-concept, self-worth, and competence to achieve explicit goals (i.e., self-efficacy), as well as self-regulation in attention, motivation, and goal determination, affect the selection and construction of environments (Bandura, 1986; Pintrich & Schunk, 1996; Zimmerman, 1989). Bandura (1986, 1991, 1997) suggests that self-efficacy and outcome expectations are the most powerful of these personal factors and are pervasive influence on academic and personal achievement. Thus, much of behavior is seen as being motivated and regulated by internal standards and evaluative cognitions, with a major emphasis on self-regulation (Bandura, 1986).

For example, an effective learning strategy promotes skill and/or knowledge acquisition, which in turn can result in greater student confidence (i.e., self-efficacy) with regard to learning in that domain (Pintrich & Schunk, 1996). Greater self-efficacy may, in turn, affect future problem-solving strategy choice. Also, poor performance on an exam or at some task may elicit anxiety from one student or increased effort from another because the same event is interpreted differently. "Thus, [self-regulated] learning occurs to the degree that a student can use personal processes to strategically regulate behavior and the immediate learning environment" (Zimmerman, 1989, p. 330) and is important, given the complex associations which are possible among personal cognitions, beliefs, and emotions (Pintrich & Schunk, 1996).

As presented in the sociological model suggested by Tinto (1975, 1986a, 1986b), the adult education model of Cookson (1986), and the premises of social cognitive theory (Bandura, 1986, 1997), it is evident that factors that influence human functionality are multidimensional and interrelated. Relevant to academic situations, Entwistle (1995) states that influences on student decision-making and performance (e.g., exams) are also multidimensional, being situational as well as adaptational and "reflecting contrasting perceptions of the same setting. At that point, strict causality fades because individuals make their own interpretations and thus take charge of their own future"(p.3). Students are not only affected by the specifics of the academic situation (e.g., exams) but also by their contrasting perceptions, which differ among students. Snow (1993) asserts that

educational researchers "... need to investigate those coherent organizations of cognitive, conative, and affective structures of processes that link to particular performance situations"(p. 1).

It follows that an individual's awareness and utilization of strategies to control the processes of knowledge acquisition and understanding (e.g., cognitive and metacognitive control strategies, self-regulation), their value of the information and self-appraisal of ability to succeed at a given task (i.e., task value, self-efficacy), their belief that learning outcomes are contingent upon their effort (i.e., control of learning), and their perceptions of worry and emotionality with regard to a specific task or general contextual events (e.g., procrastination , persistence of daily hassles) would influence student engagement and performance in specific academic settings.

Therefore, it is appropriate to investigate the relationships among achievement, cognitive, strategic, and motivational factors that are of concern to college students, For the purpose of this study, factors assessed were (a) high school grade point average, (b) motivational orientation, (c) use of learning strategies, (d) a student's tendency toward procrastination, and (e) a student's perceptions of daily hassles.

Predictor Variables

High School Grade Point Average

For reasons stated previously, post-secondary institutions are keenly interested in assessing a potential student's probability for success in the college experience. Most have relied on measures of the student's secondary (i.e., high school) academic performance. These would include the potential student's high school grade point average and scores attained on standardized tests of academic achievement, such as the American College Test (ACT), or the Scholastic Aptitude Test (SAT). Such measures have been shown to be reliable predictors of college achievement (Noble & Sawyer, 1989; Wade & Walker, 1994). Given that college faculty may not have access to official forms of this information, self-report procedures have often been utilized and have been shown to be reliable (e.g., Noble & Sawyer, 1989).

Motivation

From a social-cognitive perspective, motivation is a process through which purposive or goal-directed activity is initiated and sustained, is considered to be an important quality in academic achievement, and is inferred from behaviors such as the individual's choice of learning tasks, effort, persistence, and verbal professions of interest (Pintrich & Schunk, 1996), as well as how and when learning takes place (Schunk, 1991).

A general expectancy-value model (e.g., Eccles, 1983; Pintrich, 1988b, 1989) has been suggested for conceptualizing student motivation to learn. It proposes that three motivational components may be linked to components of self-regulated learning. These are: (a) an expectancy component, which includes a student's beliefs about their ability to successfully perform a task; (b) a value component, which includes student's beliefs about the importance and interest of a task, as well as their goals; and (c) an affective component, which includes a student's emotional reactions to a task. Predominantly, this affective component has been conceptualized as test anxiety (e.g., Garcia & Pintrich, 1995; Naveh-Benjamin, McKeachie, & Lin, 1987; Pintrich et al, 1991; Tobias, 1985). However, as is suggested from sociological models and the social cognitive perspective, anxiety may be manifested through many sources other than those associated with the classroom experience. For example college students express concerns with procrastination (e.g., Beswick, Rothblum, & Mann, 1988; Lay, 1986; Soloman & Rothblum, 1984) and daily hassles (e.g., Blankstein & Flett, 1992), which have been shown to be a significant stressors, and thus, associated with anxiety, worry, and emotionality.

Students motivated to learn are: (a) more attentive, (b) more likely to engage in organizational and rehearsal strategies to facilitate knowledge construction, (c) more likely to monitor their level of understanding, and (d) more likely to seek help from available resources (Zimmerman & Martinez-Pons, 1992), thereby improving learning and performance.

The relations among motivational factors and cognitive strategies have been extensively investigated (e.g., Garcia & Pintrich, 1995, 1996; Patrick, Ryan, & Pintrich, 1999; Pintrich & DeGroot, 1990; Pintrich et al., 1993). Components of student motivation include: (a) the perceived value of the task based on the learner's intrinsic goal

orientation, (b) the perceived value of the task based on the learner's extrinsic goal orientation, (c) the perception of the value of the task (i.e., interest, importance, utility), (d) the learner's belief that success is contingent on their ability to be self-regulative in the learning process, (e) the learner's expectancy for success, and (f) negative emotionality associated with academic tasks (Pintrich et al., 1991). Pintrich and DeGroot (1990) found that self-efficacy and intrinsic value were positively related to cognitive strategy use and to academic performance, with the best predictors of performance on classroom assignments (e.g., seat work, exams/quizzes, essays/reports) being self-regulation, self-efficacy, and test anxiety. Predictors of average grade were self-regulation and self-efficacy. Intrinsic value was found to be related to the use of cognitive strategies and self-regulation, but did not have a significant direct relation to student performance. However, the researchers state that students who make choices to be cognitively engaged and who are self-regulating are those who are interested in and value the classroom tasks (i.e., task value) and suggest that this is an important component for teachers to consider when encouraging cognitive engagement with course content. Self-regulation was the best predictor of academic performance on all outcome measures and "suggests that use of self-regulating strategies, such as comprehension monitoring, goal setting, planning, and effort management and persistence, is essential for academic performance on different types of actual classroom tasks" (p. 38). Learning goal orientation and mastery goal orientation have been shown to be associated with self-efficacy, self-regulation, and the use of self-regulative and cognitive strategies (Patrick, Ryan, & Pintrich, 1999; Wolters & Yu, 1996).

In related research, Wolters (1999) investigated the relationship between high-school student's style of active motivational regulation (i.e., motivational self-regulation strategies to maintain or increase effort and persistence) and their use of learning strategies, effort, and classroom performance. Results generally indicated that regulation strategies focused on external attainments of the task (e.g., grades) resulted in the use of cognitive strategies based on repetition and memorization, while regulation strategies focused on their desire to learn (i.e., intrinsic orientation) resulted in increased effort toward planning and monitoring strategies. However, intrinsic motivational regulation strategies were not strongly related to student classroom performance as indicated by

grades. Students who maintained their engagement with course materials through the use of extrinsic rewards or by highlighting the importance of grades tended to receive higher grades than students who adopted an intrinsic orientation. Similar results were found using a college student population (Wolters, 1998), Therefore, contextual aspects and outcome requirements of the learning environment (e.g., teacher focus on extrinsic rewards) would seem to influence and reinforce the choice of motivational strategy. Thus, students may adopt an extrinsic motivational orientation because they are consistent with the focus on attainment of grades, competition, and accumulation of rewards most common in classrooms (e.g., Anderman & Maehr, 1994).

Garcia and Pintrich (1995), reporting studies demonstrating the predictive utility of the Motivated Strategies for Learning Questionnaire, indicate that specific motivation sub-scales are most predictive of course grades. Using a college sample, they reported that, for students in the computer and natural sciences, the subscale assessing student self-efficacy (i.e., self-efficacy for learning and performance) to be the strongest predictor of course grades. For students in the social sciences, humanities, and foreign languages, the sub-scale assessing test anxiety was marginally significant. For the purpose of this study the motivational aspects of the college student experience predictive assessed were student self-efficacy, intrinsic motivational orientation, and task value.

Learning Strategies

Of interest in the area of academic achievement and aptitude, is the conceptualization and assessment of the ability of the individual to become self-directive or self-regulative in the acquisition of information and the construction of knowledge. Self-directed learning has been defined as an instructional process in which the individual is an active agent in the learning process, undertaking primary control of and responsibility for the planning, implementation, and evaluation of the learning effort (Hiemstra, 1994). This tendency toward self-direction is generally considered to be multidimensional, being (a) partially learned [e.g. the acquisition and utilization of learning strategies (McKeachie, Pintrich, & Lin, 1985; Pintrich, Smith, Garcia, & McKeachie, 1991, 1993)], (b) partially situational [i.e., affected by factors associated with the learner, such as the family or learning environments / contexts (Pratt, 1988;

Spear & Mocker, 1984)], and (c) partially the result of personality traits and dispositions (Grow, 1991). Additionally, the tendency toward self-direction is considered by some to be a characteristic or trait that exists to some degree in every person when engaged in a learning situation (Hiemstra, 1994).

Most researchers prefer the term self-regulated learning and define the concept as a multidimensional, interactive process affected by the individual, and having three dimensions: (a) a developing metacognitive awareness about self, environment, and situation; (b) the ability to formulate, understand, and to utilize goals based on that awareness; and (c) the implementing and monitoring of actions toward goal achievement (e.g., Ridley, Schutz, Glanz, & Weinstein, 1990). The individual is, therefore, considered to be an active processor of information, which is mediated by their cognitions and beliefs (Pintrich et al., 1993).

Implemented learning strategies associated with self-regulation are acquired as a result of the individual's experiences, feedback, and resultant cognitions (Weinstein & Mayer, 1985). Cognitive strategies include rehearsal, elaboration, organization, and critical thinking. Metacognitive control strategies include planning, monitoring, and regulation of cognitive processes. Resource management encompasses the effective management of time and of the study environment, effort regulation, engagement in peer learning, and help seeking when needed (Pintrich, et al, 1991,1993).

Implementation of effective learning strategies is associated with academic performance (e.g., Corno & Mandinach, 1983; Stoynoff, 1997; Weinstein & Mayer, 1986). Stoynoff (1997) determined that specific learning and study strategies were associated with student academic performance. Higher achievers, as determined by grade point average, number of credits earned, and number of withdrawals, were more effective in the utilization of social assistance in their learning, spent more time studying, and remained current with assignments. Similarly, Schutz and Lanehart (1994) found that effective learning strategies, along with the establishment of long-term educational goals and the accomplishment of educational sub-goals, improved academic performance. Using a college-age sample, Garcia and Pintrich (1995), reporting studies demonstrating the predictive utility of the Motivated Strategies for Learning Questionnaire (Pintrich et al, 1991), indicate that specific strategy subscales of the instrument are most predictive of

course grades. They report that, for students in the computer and natural sciences, the subscale of assessing time and study environment management was the strongest predictor of average course grade. For students in the social sciences, humanities, and foreign languages, the subscale assessing effort management was marginally significant.

Thus, previous research provides theoretical and empirical evidence for the inclusion of specific cognitive, metacognitive, and resource management factors in the prediction of student performance. Pintrich and DeGroot (1990) found self-regulation, to be the best overall predictor of achievement. Garcia and Pintrich (1995) found that time and study environment management, a component of resource management strategies, to be significant. Therefore, these two strategic variables were assessed and implemented in the present study.

Affective Factors

As indicated previously, the general expectancy-value model of student motivation to learn (e.g., Eccles, 1983; Pintrich, 1988, 1989) proposes three components of motivation associated with self-regulation. Predominantly, this affective component has been conceptualized as test anxiety (e.g., Garcia & Pintrich, 1995; Naveh-Benjamin, McKeachie, & Lin, 1987; Pintrich et al, 1991; Tobias, 1985). Pintrich and DeGroot (1990) found test anxiety to be negatively related to self-efficacy and to performance on exams and quizzes. Also, highly anxious students reported less self-regulation and persistence. However, as is suggested from sociological models and the social cognitive perspective, anxiety may be manifested through many sources other than those associated with the classroom experience. For example college students express concerns with procrastination (e.g., Beswick, Rothblum, & Mann, 1988; Lay, 1986; Soloman & Rothblum, 1984) and daily hassles (e.g., Blankstein & Flett, 1992), which have been shown to be a significant stressors, and thus, associated with anxiety, worry, and emotionality.

Procrastination. Procrastination is the tendency toward the purposive delay in beginning or completing a task (Ferrari, 1989; Ferrari, Parker, & Ware, 1992; Lay, 1986), which is under one's control or self-regulation (Tuckman & Sexton, 1990), to the point of experiencing subjective discomfort (Ellis & Klaus, 1977; Solomon & Rothblum, 1984).

Research has shown that procrastination is associated with low self-confidence and low self-esteem, high states of anxiety, depression, neurosis, forgetfulness, disorganization, non-competitiveness, and lack of energy (Beswick, Rothblum, & Mann, 1988; Effert & Ferrari, 1989; Ferrari, 1991a; Janis & Mann, 1977; Lay, 1986, 1987,1988; McCown, Johnson, & Petzel, 1989; Soloman & Rothblum, 1984). Individuals may procrastinate: (a) to protect a vulnerable self-esteem, as a response to fear of failure, or as a demonstration of rebellion to those in authority (Burka & Yuen, 1983); (b) to avoid information about their perceptions (rational or irrational) of their own abilities on given tasks (Ellis & Klaus, 1977; Ferrari, 1991b); and (c) as a response to fear of success (Rorer, 1983).

Procrastination is also associated with particular cognitive and behavioral characteristics. Procrastinators, as compared to non-procrastinators, exhibit greater public self-consciousness, social anxiety, and self-handicapping tendencies (Ferrari, 1991a, 1991b), as well as being concerned with appropriate self-presentation (i.e., overly concerned with public image) and public approval (Ferrari, 1991b). They choose to engage in tasks that they believe will be most valued by their audience, portraying a public image of being a hard worker (e.g., expending great effort) while avoiding negative perceptions of ability. Related to this conceptualization, self-efficacy is negatively associated with engagement in procrastination (Ferrari et al., 1992). Therefore, those who perceive that they possess the capacities and abilities to achieve mastery of a task procrastinate less.

Procrastination has been found to be a particular concern to college students. Ellis and Klaus (1984) estimated that 95 % of American college students procrastinate. Soloman and Rothblum (1994) found that 50 % of students included in their survey reported that they procrastinated on academic tasks at least half of the time, with an additional 38 % reporting that they procrastinated occasionally. Primary reasons for academic procrastination were fear of failure at the academic task (e.g., writing a term paper) and the perceived aversiveness of the task (Rothblum, Soloman, & Murakami, 1986; Soloman & Rothblum, 1984).

Academic procrastination is associated with the late submission of assignments, delay in taking quizzes in self-paced courses, and obtaining low grades (Beswick et al., 1988; Lay & Burns, 1991; Rothblum, et al. 1986). It is has also been found to be

negatively correlated with grade point average (Senecal & Koestner, 1995). Additionally, academic procrastination is related to irrational beliefs about one's abilities, anxiety in social situations, depression, perfectionism, self-handicapping, low self-esteem, and low self-confidence (Ferrari, 1991a; Frost, Marten, Lahart, & Rosenblate, 1990; Solomon & Rothblum, 1984), as well as to a high degree of test anxiety and to low self-regulation (Milgram, Dangour, & Raviv, 1992; Senecal & Koestner, 1995).

Research has indicated a relationship between procrastination and motivation, as well as with other factors associated with college student success. For, example, in a study of students in a junior college, Senacal and Koestner (1995) found that students who engaged in academic tasks for intrinsic reasons (i.e., intrinsic motivation) procrastinated less than those who exhibited external regulation. Related research has also shown that procrastination is inversely related to self-efficacy (Tuckman, 1991) and positively related to state and trait anxiety (Haycock, McCarthy, & Skay, 1998). In addition, Wesley (1994) found that, for college-age men and women, procrastination was capable of accounting for significant variance in college cumulative grade point averages, beyond that attributed to SAT (The Scholastic Aptitude Test) scores and high school grade point average. He suggests that college personnel may improve the process of student selection by incorporating an assessment of procrastination.

Hassles. Kanner, Coyne, Schaefer, and Lazarus (1981) state that hassles are "the irritating, frustrating, distressing demands that to some degree characterize everyday transactions with the environment"(p.3), and are a major source of stress for the individual. Their incidence is more frequent and their effect has been shown to be even more predictive of an individual's subjective well-being and psychological dysfunction (Chamberlain & Sitka, 1990; Kanner et al., 1981) than are major life events, as described by Holmes and Rahe (1967). They are also associated positively with anxiety and depression, and inversely with self-restraint, perceived social competence, self esteem, daily health, and overall health status in adolescents (Kanner, Feldman, Weinberger, & Ford, 1987; Wu & Lam, 1993). Events that are considered as hassles have been found to differ for students, mothers, middle-aged adults, the elderly, and health professionals (Chamberlain & Sitka, 1990; Kanner et al., 1981), as well as for different age groups (Folkman, Lazarus, Pimley, & Novacek, 1987) reflecting differences in individual and

social concerns relevant to each group. Of particular interest are daily hassles (i.e., those which occur frequently) that have been identified as being of concern for college students. The most frequently identified negative events (hassles) associated with the undergraduate college student experience were found to be misplacing and losing things, troubling thoughts about the future, and not getting enough sleep (Elliot, Gramling, Lee, Elliott, & Shrout, 1989). Essentially these are problems with self-regulation, which may hinder attainment of academic goals. Similarly, in the development of the Brief College Student Hassles Scale (BCSHS), Blankstein, Flett, and Koledin (1991), surveyed college students concerning hassles that they had recently experienced. The major areas of concern were found to be school, social, future security, work, financial, environmental, household, family, and personal appearance. Perception of daily hassles has been shown to be a significant contributing factor in the prediction of grade point average, social adjustment and psychological symptoms (Brooks & Dubois, 1995). However, the relationships among daily hassles and other factors associated with student success in college (e.g., learning strategies, motivation, procrastination), as well as course engagement and performance (e.g., final examination scores) has not been investigated.

Grouping Variable

A means by which an instructor often rates a student's performance, or lack there of, is with relation to a performance category. Rather, than utilizing a continuous measure (e.g., examination scores), instructors delineate an individual student's performance or engagement by the use of some nominal category (e.g., "good student", "poor student"). Often, inclusion is subjective and determined without the use of a specific criterion for membership. However, the format and procedures of the course from which data for this study were collected offered the researcher information regarding the time course of a student's engagement with course materials, such as the amount of time that a student took to complete the course (i.e., eligibility and date a student takes the final examinations), as well as information about students who do not complete the course. For the purpose of this study, three distinct criterion groups were considered for the analysis. Two groups were determined using a median of students who completed the course. These were designated as (a) early finishers, and (b) late finishers. The third

group considered were students who did not complete the course (i.e., those students who officially or unofficially withdrew from the course) and was designated non-finishers.

As is evidenced above, factors influencing a student's success in the college experience are multidimensional and interrelated with specific factors being identified in previous research that are associated with measures of achievement (e.g., ACT, SAT) and performance (e.g., grade point average). However, questions remain as to the relationships among these factors and their ability to accurately predict a student's performance in a particular course. Also, relationships among these factors and their ability to predict group membership relative to engagement in a particular course are of interest. The purpose of this study was to discern the predictive ability of factors associated with the college student experience (i.e., high school, motivational orientation, learning strategy utilization, procrastination, perceptions of daily hassles) in determining student course engagement as defined by group membership (i.e., early finisher, late finisher, non-finisher).

Method

Participants

Participants were 149 college students enrolled in selected sections of an introductory psychology course at a regional public university in Kentucky. Data were accumulated over a period of three semesters. Participants (N=139) ranged in age from 17 to 41 years (M = 20.4, SD = 3.18). There were 81 females, ranging in age from 17 to 41 years (M = 20.11, SD = 3.88), and 57 males, ranging in age from 18 to 27 years (M = 19.13, SD = 1.82). With respect to academic status, 46.4% (n = 64) of participants indicated that they were freshmen, with 34.1 % (n = 47) indicating that they were sophomores. Eighteen participants (13%) indicated that they had achieved junior status, with nine (6%) indicating that they had achieved senior status. Participants identified themselves as being Caucasian (n = 115), Black (n = 12), Asian (n = 6), Hispanic (n = 2), or other (n = 3). With respect to religious preference, 24 indicated Protestant, 15 indicated Catholic, and one indicated Jewish. The majority (n = 98) selected either 'none' or 'other' in response to this questionnaire item.

Course Format and Design

The course was designed to incorporate the concepts of CAI (computer aided instruction), and the fundamental principles of PSI (Personalized System of Instruction) as described by Keller (1968, 1972, 1981). PSI is considered to be a synthesis of the principal elements of both mastery learning (Bloom, 1981) and programmed instruction (Skinner, 1954). The system incorporates five principal features that distinguish it from other instructional delivery systems (Keller, 1968; Buskist, Cush, & DeGrandpre, 1991). These features are (a) student self-pacing, (b) unit mastery, (c) the de-emphasis of instructional lectures, (d) the use of student proctors, and (e) an emphasis on written materials. The Personalized System of Instruction has been used primarily as a replacement for traditional lecture classroom teaching in higher education (e.g., Keller, 1968; Cook, 1990; Fletcher, 1992). Additionally, PSI has been shown to be an effective instructional delivery system in various academic disciplines (e.g., psychology, statistics, engineering) and has produced greater student achievement with significantly less variation among students than traditional lecture courses (Kulik, Kulik, & Cohen, 1979; Dunkin & Barnes, 1986).

Personal computer workstations and local area network (LAN) systems now make it possible to more closely and efficiently monitor the progress of individual students. The implementation of such a system, combining the elements of PSI with present technology, presents several advantages. These include: (a) effective and efficient presentation and scoring of course quizzes and criterion mastery tests; (b) increased availability to students for the purposes of engaging in these activities; (c) immediate, individualized, and effective presentation and evaluation of other assessments of interest to the instructor (e.g., surveys, questionnaires, etc.); (c) presentation and control of tutorial and supplemental materials; and (d) automatic accumulation and storage of data associated with an individual student's profile of engagement with the course materials (e.g., the number of attempts to achieve mastery on quizzes or tests; the amount of time spent engaged in the utilization of course tutorials, practice quizzes, and unit mastery tests; the size of the accumulated data file; the dates and times at which the student initiated engagement).

The common experience for all students in the course was the requirement that they achieve criterion levels of mastery on core content units (i.e., chapters) considered foundational and essential to the understanding of psychology before they were permitted engagement with unit materials of their own choosing (i.e., the remaining chapters). These core content units were to be attempted and criterion mastery achieved by each student before continuing with additional units or chapters. These core units were (a) introductory information, (b) basic research methodology, (c) physiological psychology, and (d) principles of learning, and corresponded with chapters in the text used. After attaining mastery of these units, students could choose any of the other course units (i.e., chapters) in any sequence in order to accumulate points toward final course grade.

Procedures

For this course, all questionnaires and surveys, quizzes, and examinations were presented, and data recorded, scored, and analyzed by personal computers connected to a dedicated computer server. It should be noted that the physical and technical components of this course were in place for several successive semesters of instruction and were found to be reliable in the delivery of course materials and the accumulation and scoring of data relevant to the present study and other research.

Students began the course with an introductory session in which they were presented a description of the course format (i.e., syllabus) and brief instructions pertaining to (a) the location of designated computer facilities, (b) the use of individual computer workstations and programs pertaining to the course, (c) the dates and hours that facilities are available to students, and other pertinent information. The class met formally for the first three scheduled sessions. Data for the present study were collected during these sessions.

Each student was given informed consent documentation necessary for participation in the research study. The instructor / experimenter informed students of specific procedural information of the study and explained that each student, at his or her discretion, could withdraw from the study at any time without penalty or consequence.

Following the initial orientation session previously described, students participated in two class sessions at the beginning of the semester during which they completed pre-course assessments, research questionnaires and surveys, and a

demographic questionnaire. Activity sessions (e.g., computer simulations or exercises, individual / group observations), lecture and discussion sessions addressing the principal instructor's research and /or principal course topics of psychological inquiry, or tutorial sessions were conducted intermittently throughout the semester. Tutorials and simulations, as well as unit practice quizzes, and unit mastery tests / examinations were presented to each student via computer workstation.

The course was essentially self-paced. A student determined (a) his or her rate and degree of engagement (i.e., the amount of time spent in the computer labs working on various course materials), and (b) the order and sequence of course units corresponding to topic chapters in the course text. The text for the course was the eighth edition of Introduction to Psychology: Exploration and Application (Coon, 1997). All students were required to attain mastery criteria for each of the four core content areas (i.e., introductory concepts, research methods, physiological psychology, principles of learning). Following completion of these core units, students were free to choose other units (i.e., chapters) in any order and sequence.

Upon attainment of criteria sufficient to complete the course, students were administered both sections of the final exam via computer workstation. Depending upon an individual student's rate of engagement and performance, it was possible for them to complete the course well before the end of the semester. Final Examination I contained multiple-choice questions regarding content relevant to the essential core units as previously discussed.

Demographic Variables

Subjects were asked to respond to a demographic questionnaire that included items asking them to report age, ethnicity, religious affiliation and sex. Additional survey items asked that they report their approximate high school grade point average, college grade point average, and class status (i.e., freshman, sophomore, etc.).

Materials

Assessment of factors related to the college student experience (i.e., motivation, learning strategies, procrastination, daily hassles) was accomplished by the administration of the self-report questionnaires and surveys listed. As discussed previously, these were chosen with regard to their individual and collective utilitarian

value to the college instructor and, subsequently, to students, in predicting student performance and engagement. Criteria for choosing these questionnaires included that each be (a) available for utilization (i.e., public domain or with author permission), (b) relatively concise in format (i.e., a manageable number of items), (c) an acceptably valid and reliable instrument for measuring the attribute, (d) adaptable to the specific needs of the instructor and the researcher, and (e) adaptable to computer workstation administration and quantitative numerical scoring (e.g., Likert scale). Administration of all questionnaires was conducted during the second and third regularly scheduled class meetings of a given semester (i.e., within the first two weeks of the beginning of the course).

As previously discussed, these assessments were modified so as to be presented singularly to each student via networked computer workstation and administered in such a way that each student was presented with, and was required to respond to, only one survey and a single survey item at a time. The program was constructed so that students were presented with the following information for each of the assessments in the same sequence: (a) an introductory statement regarding the questionnaire; (b) instructions regarding how the student is to make and record response choices; and (c) the list of items for the presented inventory / survey / questionnaire. Students were required to respond to each item as it was presented. If the student failed to respond to an item or items, the program was constructed in such a way that the student was presented with those items at the end of the questionnaire, and was, therefore, required to appropriately respond before they could exit the questionnaire and the session.

Motivational Orientation and Learning Strategies

The Motivated Strategies for Learning Questionnaire (MSLQ) is an 81-item self-report instrument, incorporating 15 subscales. It was designed to assess the motivational orientation of college students and their use of different strategies for learning that the individual implements in a college course. The MSLQ is based on a general cognitive view of motivation and learning strategies, with the student being represented as an active processor of information whose beliefs and cognitions are important mediators of instructional input (Pintrich et al., 1993). The instrument consists of two sections. For each item of the instrument, students rate themselves on a 7- point Likert-type scale

ranging from 1 ("not at all true of me") to 7 ("very true of me") with some items being reverse scored. Scale scores for each of the 15 subscales are determined by calculating the mean of the items that comprise each subscale.

Pintrich et al. (1991) stated that the correlation of scale scores with final course grades is moderate but significant, demonstrating predictive validity. They also reported Cronbach's alpha, an assessment of internal reliability, for each of the 15 subscales. These range between .52 and .93.

Motivational orientation. The motivation section of the Motivated Strategies for Learning Questionnaire was used to assess the substantive components of an individual student's motivation (e.g., Pintrich et al., 1991), and is based on a social-cognitive model that proposes three general motivational constructs: (a) expectancy, (b) value, and (c) affect (Pintrich, 1988a, 1988b, 1989). This section is comprised of 31 items "assessing the student's goals and value beliefs for a course, their beliefs about their skills to succeed in a course, and their anxiety about tests in a course" (Pintrich et al., 1993, p. 804). Three subscales of the motivation section of the MSLQ were used in the present study to measure the selected factors. These were the subscales measuring: (a) intrinsic motivation or goal orientation (IGO), (b) task value (TV), and (c) self-efficacy of learning and performance (SELP).

Learning strategies. In the present study, the learning strategies section of the Motivated Strategies for Learning Questionnaire (Pintrich et al., 1991) was used to assess a student's utilization of cognitive and metacognitive learning strategies, as well as their management of physical resources in the learning environment. This section is based on a general cognitive model of learning and information processing (e.g., Weinstein & Mayer, 1986), and consists of 50 items encompassing three areas along nine subscales. For the purposes of this study, the subscales assessing metacognitive self-regulation (MSR) and management of time and study environment (TSER) were utilized.

Procrastination

For the present study, the construct of procrastination was assessed using the Procrastination Scale (Tuckman, 1991), a self-report measure designed to assess an individual's procrastination tendencies, which was operationally defined as the lack or

absence of self regulated performance and the resultant tendency to delay or avoid completely a task of which the individual has control (Tuckman & Sexton, 1990). The instrument consists of 35 statements regarding feelings and behaviors associated with procrastination. Subjects respond to each item utilizing a four-point Likert scale with regard to the degree that each statement refers to their feelings and/or behaviors [i.e., (1) "that's me for sure," (2) "that's my tendency," (3) "that's not my tendency," (4) "that's not me for sure"].

The Procrastination Scale was developed from a larger survey that consisted of 72 statements referencing three topics (Tuckman, 1991). The topics were (a) a general self-description of the individual's tendency to delay initiation of tasks, (b) a tendency of the individual to experience difficulty doing unpleasant things and to actively work to avoid or reduce unpleasant feelings of such tasks, and (c) a tendency to attribute the cause of unpleasant circumstances to others (Tuckman, 1991). The author derived the 35-item Procrastination Scale created from the original 72 items. According to Tuckman (1991), "... the Procrastination Scale appears to provide a valid and reliable estimate of the tendency to waste time, delay and intentionally put off things that should be done" (p. 479). A cumulative score of procrastination is calculated by summing the adjusted scores of the 35 items.

Daily Hassles

For the present study, the Brief College Student Hassles Scale (Blankstein et al., 1991) was used to assess perceptions of daily hassles. This is a modified version of the Brief College Hassles Scale (Blankstein & Flett, 1992), a 20-item measure derived from the 117-item Hassles Scale constructed by Kanner, Coyne, Schaefer, and Lazarus (1981).

The Hassles Scale constructed by Kanner et al. (1981) was originally developed for use with middle-aged adults. In response to the need for specificity in the assessment of daily hassles, researchers developed instruments for early adolescents (Kanner, Feldman, Weinberger, & Ford, (1987), adolescents (Compas, Davis, Forsythe, & Wagner, 1987), older and younger men (Ewedemi & Linn, 1987), and elderly men and women (Holahan & Holahan, 1987). Additionally, Blankstein, Flett, Hewitt, Koledin, and Mosher, as cited in Blankstein et al. (1991) expressed concerns of the validity of The Hassles Scale (Kanner et al., 1981) when considering relevant life experiences of college

students, especially those of the majority of undergraduates. Research indicated that daily problems for college students were typically academic, social, and financial in nature (Fisher & Hood, 1987; Flett, Pliner, & Blankstein, 1989). As a result, the Brief College Hassles Scale (Blankstein & Flett, 1992) was derived from The Hassles Scale (Kanner et al., 1981).

Concern as to whether or not the Brief College Hassles Scale (BCHS) sampled the entire domain of college student hassles prompted Blankstein and Flett (1991) to develop a revised version of the scale, addressing relevant hassles that college students had specifically reported. Subsequently, the Brief College Student Hassles Scale [BCSHS] (Blankstein & Flett, 1991) was constructed, containing items relevant to the college student experience. Specifically a disproportionate number of items reflecting academic, social, and financial concerns were included. This instrument was administered to participants in the present study.

Following procedures similar to those of Blankstein and Flett (1991), participants were presented with a general definition of hassles and asked to respond to each item on the inventory in terms of the event's persistence (i.e., a combination of the frequency and duration of experienced hassles) relative to their personal experiences. For the purpose of this study, subjects responding to the questionnaire items were instructed to consider the relative persistence of each item and rate each using a 7-point Likert-type scale. The scale for each item ranges from 1 ("This has never been a hassle for me"), to 7 ("This is a hassle for me most of the time"). A cumulative score of hassles severity and persistence is calculated by summing the scores for each of the 20 items. The range of the scores is between 20 to a maximum of 140.

Results

The means and standard deviations attained for each of the predictor variables is shown in Table 1. The results obtained were compared with descriptive statistics reported in previous studies discussing the construction and validation of the selected instruments and subscales (Blankstein et al., 1991; Pintrich et al., 1991; Tuckman, 1991).

Means and standard deviations for the selected motivation subscales and the selected learning strategies subscales of the Motivated Strategies for Learning Questionnaire used in the present study compared favorably with those reported by Pintrich et al. (1991) and Pintrich et al. (1993).

Tuckman (1991) reports a median score of 89 for a list of 72 four-point Likert scale items used to construct the Procrastination Scale (N=50). Subsequent factor analysis of these items identified the 35 items selected for the Procrastination Scale (PRO). This 35-item scale was administered to participants in the present study.

For the perception of daily hassles measure utilized for this study (HASS), the authors report descriptive information (i.e., mean, standard deviations) for each of the 20 items comprising the Brief College Student Hassles Scale (Blankstein et al., 1991). By totaling the mean item scores presented, a mean score for the instrument was calculated (M = 64.85). Compared to participants in previous research, participants in the present study attained similar mean scores on the instrument.

Analysis was performed using SPSS^x REGRESSION and SPSS^x FREQUENCIES for evaluation of assumptions. Results of evaluation of remaining assumptions led to transformations of the selected motivation variables to reduce skewness in their distributions and improve normality, linearity, and homoscedasticity of residuals. The selected motivational variables were significantly negatively skewed. Tabachnick and Fidell (2001) describe appropriate data transformations. Based upon the severity of and direction of skewness of these variables, a square root transformation was used on the measure of intrinsic goal orientation (IGOTR), with logarithmic transformations used on the measures of task value (TVTR) and self-efficacy for learning and performance (SELPTR). No other variables required transformation. Correlations among predictor variables after transformation procedures were employed are shown in Table 2.

Table 1

Means and Standard Deviations of Predictor Variables

Variable	MEAN	SD
HSGPA*	3.17	.50
MSLQ Motivation		
IGO**	4.77	1.08
TV**	5.46	1.12
SELP**	5.63	1.09
MSLQ Stategies		
MSR**	4.63	1.05
TSER**	4.78	1.16
PRO**	82.70	14.55
HASS**	63.95	19.86

*(N=134); ** (N=122)

IGO = Intrinsic Goal Orientation
TV = Task Value
SELP = Self Efficacy for Learning and Performance
MSR = Metacognitive Self-Regulation
TSER = Time-Study Environment Regulation
PRO = Procrastination
HASS = Perceptions of Daily Hassles

Table 2

Intercorrelations Between Predictor Variables Following Transformation

Variables	HSGPA	IGOTR	TVTR	SELPTR	MSR	TSR	PRO
HSGPA							
IGOTR	.009						
TVTR	.012	.60**					
SELPTR	.22*	.37**	.38**				
MSR	.10	.53**	.59**	.45**			
TSER	.09	.30**	.32**	.29**	.68**		
PRO	.007	-.41**	-.36**	-.30**	-.52**	-.51**	
HASS	.014	-.17	-.10	-.27**	-.29**	-.34**	.37**

*p<.05. **p<.01.

IGO = Intrinsic Goal Orientation
TV = Task Value
SELP = Self-Efficacy for Learning and Performance
MSR = Metacognitive Self-Regulation
TSER = Time-Study Environment Regulation
HASS = Perception of Daily Hassles
PRO = Procrastination

The application of Mahalanobis distance, applying a criterion of $p<.001$, indicated no multivariate outliers among the cases (Tabachnick & Fidell, 2001).

The correlations among the transformed variables selected for the present study are shown in Table 2. As can be seen, high school grade point average (HSGPA) was correlated with only one of the motivational orientation or learning strategies variables – that of Self-Efficacy of Learning and Performance (SELPTR). The motivation and learning strategies subscales of the MSLQ selected for the present study were highly intercorrelated. These results are similar to those obtained by the developers of the Motivated Strategies for Learning Questionnaire (Pintrich, et al., 1991). As expected, the measures assessing procrastination (PRO) and perceptions of daily hassles (HASS) show a negative relation with the selected motivation and strategy information subscales. In addition, Procrastination (PRO) and Perceptions of Daily Hassles (HASS) are significantly positively correlated.

A direct discriminant function analysis (SPSS^X DISCRIMINANT) was conducted to determine the ability of the seven variables - self-reported high school grade point average, the three motivation variables, the two learning strategy variables, procrastination, and perceptions of daily hassles to predict one's engagement in the course.(i.e., early finisher, late finisher, non-finisher). In addition to self-reported high school grade point average, the motivation variables, after transformation, corresponding to intrinsic goal orientation (IGOTR), task value (TVTR), self-efficacy of learning and performance (SELPTR)] were included in the analysis. Also, the selected learning strategy variables [i.e., time-study environment regulation (TSER), metacognitive self-regulation (MSR)], procrastination (PRO), and perceptions of daily hassles (HASS) were used. A median split procedure was applied to participants completing the course to determine early finishers (N = 47) and late finishers (N = 49). Those who did not complete the course were defined as non-finishers (N = 16). Of the original 149 cases, 112 cases were included in the analysis. With the use of a $p < .05$ criterion for Mahlanobis distance, no multivariate outliers among the cases were identified. Evaluation of assumptions of linearity, normality, and multicolinearity. Results of Box's M Test was significant and indicated heterogeneity of covariances, therefore interpretations may be

limited. Table 3 displays the means and standard deviations for the three groups on each of the selected predictor variables.

The analysis generated two discriminant functions, however only the first function was significant, Λ=.895, X^2 (4) = 12.092, p = .02. After removal of the first function, the association between groups and predictors was not significant. The first discriminant function accounted for 88% of the between-group variability. and maximally separates early finishers from the other two groups. Table 3 shows the loading matrix of correlations between predictors and discriminant functions, discriminant function coefficients, univariate F, and Wilk's Λ. It suggests that the best predictor for distinguishing between early finishers and the other two groups (first function) is high school grade point average (HSGPA). Loadings less than .50 were not interpreted. Table 4 shows the means and standard deviations of predictor variables by group. Early finishers attained higher achievement as inferred by HSGPA (M = 3.32, SD = .45) than either late finishers (M = 3.11, SD = .53) or non-finishers (M = 2.97, SD = .43).

Contrasts were performed where the early finishers group was contrasted with the other two groups (i.e., late finishers, non-finishers), pooled, to determine which predictors reliably separate the groups. Keeping overall α.<.05 for the predictors, only high school grade point average (HSGPA) significantly separates early finishers from the other two groups, F(1, 109) = 4.63. Classification results revealed that the original grouped cases were classified with 39.1% overall accuracy. Accuracy by each group was 57.7% for early finishers, 18.0% for late finishers, and 55.0 % for non-finishers. Group means for the function indicate that early finishers had a function mean of .345, late finishers had a mean of -.162, and non-finishers had a mean of -.517. These results indicate that individuals who have higher achievement (HSGPA) were more likely to be early finishers of the course.

Although the second discrimnant function was not significant, Λ=.9863, X^2(1)=1.50, p=.22, one predictor, procrastination (PRO), has a loading in excess of .50 on the function which separates late finisher from non-finishers. Surprisingly, late finishers (M = 85.33, SD = 14.70) have a slightly greater tendency toward procrastination than do non-finishers (M = 82.09, SD = 17.71).

Table 3

Means and Standard Deviations of Predictor Variables by Group

	Early Finish N=47		Late Finish N=49		Non - Finish N=16	
Predictor Variable	MEAN	SD	MEAN	SD	MEAN	SD
HSGPA	3.32	.45	3.11	.53	2.97	.43
IGOTR	1.74	.34	1.79	.30	1.79	.25
TVTR	.35	.20	.39	.20	.33	.17
SELPTR	.30	.21	.36	.20	.33	.16
MSR	4.77	1.03	4.47	1.08	4.67	1.00
TSER	4.91	.96	4.69	1.20	4.70	1.49
PRO	79.98	12.60	85.33	14.70	82.09	17.71
HASS	62.42	20.81	65.05	20.03	64.70	17.27

IGO = Intrinsic Goal Orientation

TV = Task Value

SELP = Self Efficacy for Learning and Performance

MSR = Metacognitive Self-Regulation

TSER = Time-Study Environment Regulation

PRO = Procrastination

HASS = Perceptions of Daily Hassles

Table 4
Results of Discriminant Function Analysis of Predictor Variables

Predictor Variable	Correlations of Predictor Variables with Discriminant Functions		Discriminant Function Coefficient		Univariate		
	1	2	1	2	*F(2, 109)*	Λ	*p*
HSGPA	.89*	.45	.90	.42	4.61	.922	.012
IGOTR	-.16	.38*					
TVTR	-.17	.32*					
SELPTR	-.32*	.18					
MSR	.33	-.40*					
TSER	.29	-.43*					
PRO	-.42	.91*	-.45	.89	1.62	.895	.017
HASS	-.13	.32*					
Cannonical *R*	.305	.117					
Eigenvalue	.103	.014					

HSGPA = Self Reported High School GPA
IGOTR = Intrinsic Goal Orientation (Transformed)
TVTR = Task Value Orientation (Transformed)
SELPTR = Self Efficacy fof Learning and Performance (Transformed)
MSR = Metacognitive Self-Regulation
TSER = Time-Study Environment Regulation
PRO = Procrastination
HASS = Perceptions of Daily Hassles

Discussion

The major purpose of the present study was to investigate the relationships among carefully selected cognitive, behavioral, and affective factors associated with student performance in a college psychology course. In addition, the ability of these factors to determine who was more likely to finish the course, were investigated. Examination of the results of the present study parallel and support, to some extent, results found in previous studies. As reported by Pintrich et al., (1991, 1993) the subscales of the Motivated Strategies for Learning Questionnaire are highly intercorrelated. Surprisingly only one of the MSLQ subscales, Self-Efficacy for Learning and Performance, after transformation (SELPTR), was associated with high school grade point average (HSGPA). This suggests that those whose experience in high school was positive and successful have acquired a belief in their ability to achieve academically.

Procrastination was found to be negatively related with the motivation and strategy variables and positively related with daily hassles. Although the second discriminant function was not significant, procrastination did load heavily on the function. Loading of additional variables in the analysis reveal a somewhat paradoxical pattern. These results would suggest that individuals who have greater tendencies toward procrastinatory behavior (PRO), may recognize the importance of learning (IGO) and value their participation in the learning endeavor (TVTR), but have difficulty in the control of both their personal study environment (TSER) and their thought processes (MSR), and perceive the impact of daily life events (HASS) to be more "demanding." Therefore, they may be likely to "wait to the last minute" to complete academically important tasks such as completing requirements for a course which heightens anxiety (Ferrari, 1991a, 1991b). Perhaps the exhibition and reinforcement of procrastination in previous academic settings (e.g., high school) resulted in little retribution from teachers or negative consequence and completing assignments at the last minute did not result in any action that might produce, or become associated with, feelings of anxiety and lower evaluation of academic work. Therefore such maladaptive behavior (i.e., procrastination) was perpetuated.

Previous research has shown hassles to be a major source of stress for individuals, predicting difficulties with social adjustment, and psychological dysfunction (Brooks &

Dubois, 1995; Chamberlain & Sitka, 1990; Kanner et al., 1981). They also have been shown to be positively associated with anxiety and depression, and inversely with perceived social competence and self-esteem (Kanner et al., 1987). The present study supports these findings. Hassles were negatively related to MSLQ subscales assessing self-efficacy (SELP), time-study environment regulation (TSER), and metacognitive self-regulation (MSR). Examination of Table 2 indicates that procrastination (PRO) and perceptions of daily hassles (HASS) may impact the ability of individuals to view themselves as being capable of achieving success in a specific task or academic endeavor (SELPTR), and may also negatively influence their perception and use of effective cognitive and metacognitive strategies to achieve these tasks and goals (MSR). This indicates the impact that anxiety associated with maladaptive behaviors has toward academic motivation and use of effective learning strategies, and underscores the consideration of affective variables in the assessment of learning and performance.

Results of discriminant function analysis to determine if carefully selected predictor variables could be used by an instructor to determine the likelihood of student success, early in the school term (i.e., semester), proved to be somewhat disappointing. The only predictor significantly related to the discriminant function determining early finishers, and late finishers /non-finishers was high school grade point average (HSGPA). This is not surprising given the demonstrated use and consistent reliability of high school grade point average as a predictor of college success (e.g., Wade & Walker, 1994).

It is of interest that, in the present study, variables previously found to be associated with academic performance (e.g., intrinsic goal orientation), or to be of concern to college students (e.g., procrastination), were not significant predictors in determining whether a student finished the course. This supports the further investigation of affective and non-cognitive factors and their impact on academic performance. However, results of the present study may have been affected by some limitations of its design. These limitations are discussed in the next section.

Course format did not play a role in the results of the present study. Since surveys and questionnaires were given before students had direct experience with the mechanics, protocol, and engagement with the course materials, they would have minimal

information to formulate perceptions about the course. Therefore, their responses to questionnaire items would not have been affected.

Limitations

The present study has several limitations that may affect the generalizability of its results. There are limitations associated with the measures selected, the mechanics of the course delivery and data collection schedule, and the sample.

First, the variables and the associated surveys may not have been appropriate. Contrary to previous research, motivational orientation, specific learning strategies, and tendencies toward procrastination may not be the major concerns of students residing in the geo-political region that constitutes the service area of the institution. It is possible that factors not selected for analyses (e.g., critical thinking, test anxiety), but that have been shown to be associated with academic performance, might have been more predictive of performance and engagement for participants in the present study. Perhaps other affective influences, such as dispositional optimism (e.g., Scheier & Carver, 1985; Carver & Scheier, 2001), or attitudes about family commitments (e.g., Tinto, 1975, 1986a, 1986b), which have been shown to be associated with the college experience, are more salient factors for participants than those assessed in the present study.

Secondly, students at this time in their college experience (i.e., within the first three semesters of their post secondary careers) may not understand that they should be concerned about affective factors associated with the college experience. This would include the problems associated with procrastination. In addition, they would generally experience relatively few hassles at this point in their experience (i.e., within the first two weeks of a semester). Also, hassles associated with this time of their college experience (e.g., socializing) may serve as a positive energizer of behavior, initiating an "adrenaline rush", so to speak, which initially seems positive. Further research should explore the developmental aspects of these factors, to chart and define changes with regard to the college experience. This would require a longitudinal design and would most likely encounter problems of participation and attrition. In addition, it is possible that students who attend different institutions (e.g., state-supported regional universities, land grant

institutions, private colleges) would exhibit differences in attitudes toward the value of post-secondary education, level of preparation, or perceptions of the college experience.

A third concern relates to the time during the semester that the surveys were administered. The Brief College Student Hassles Scale (Blankstein et al., 1991) was constructed to target specific events and concerns that were relevant to college students. The Procrastination Scale (Tuckman, 1991) is less specific to a particular population, but was developed using college students. It would seem, however, that most students, regardless of class standing, would be confronted with these events and experience similar concerns. In other words, whether students are first-semester freshmen or a fifth year seniors, they most likely have concerns regarding relationships, finances, academic and course deadlines, health, and so forth. Perceptions of daily hassles through the course of a given semester or over the time course of their college career would be of interest. However, such investigation was beyond the scope of the present study.

The Motivated Strategies for Learning Questionnaire (Pintrich et al., 1991), however, is course-specific with respect to the presentation of the majority of the survey items. Students are directed to frame their responses with regard to the specific course in which the instrument is given. Pintrich and his colleagues indicate that, during the process of developing and assessing the validity and reliability of the instrument, they administered the MSLQ toward the end of any given semester (Pintrich et al., 1991). Students would, therefore, have greater knowledge with regard to specific course format and construction of examinations, as well as their individual feelings about aspects of the given course and instructor. This is congruent with the intended purpose of the questionnaire, which was to assess college students' motivational orientation and their use of different learning strategies. Given the intended purpose of the present study, all of the surveys selected were given to students within the first two weeks of the semester. Therefore, students would have limited knowledge about specific aspects of the course. Also, the majority of students assessed in the present study were underclassmen (80.5 %), and would have had little or no previous college experience. Therefore, it seems likely that they would be less accurate in their perceptions of self-efficacy and less objective in their valuing of specific course content. They also would be less likely to

adequately ascertain and implement necessary strategies for success in the specific course (e.g., self-regulative strategies, time-study management skills).

Administering the selected subscales of the MSLQ to participants during the first two weeks of the academic term may be called into question. The use of these subscales as predictors of student performance and engagement would seem to be limited when presented in this way. However, a major purpose of the present study was to assess the validity and reliability of such. Essentially, the present study was intended to demonstrate the utility of the selected surveys to predict what students will do in a specific course. Administering the MSLQ toward the end of any given semester would limit its utility in the prediction of future performance and engagement. Essentially, the information is gathered and evaluated too late to be of use. There would seem to be little time to affect student performance in a particular course if the majority of assessments, including content examinations and assessment of student engagement, were postponed until the end of a given semester.

Finally (and perhaps fatally for the present study) the overall size of the participant sample and the unequal sample sizes within groups most probably contributed to "difficulties" with the analyses. This is evidenced by the significance of Box's M Test. In addition, results of tests to assess the reliability of the selected subscales as significant descriptors of group membership (i.e., early finishers, late finishers, non-finishers) indicated that only the student's high school grade point average loaded sufficiently on the first discriminant function to warrant interpretation. A median split on a parameter does not necessarily constitute a "natural" division of participants with regard to group assignment. Also, the difference in size of the groups may influence the predictive validity of discriminant analyses in this case. Logistic regression may be the preferred alternative. However, inspection of the correlations of predictors with discriminant functions would indicate interesting and somewhat paradoxical relationships among these non-academic factors that warrant further investigation.

Implications / Suggestions

Despite its limitations, one can draw several implications from this study. The results, although statistically disappointing, demonstrate the usefulness of a multidimensional approach to the study of factors affecting academic performance. This

is suggestive of the sociological perspective discussed previously and illustrated by Tinto (1993) and Cookson (1986). Including cognitive, affective, and behavioral factors, as well as academic indicators (e.g., HSGPA) in the assessment of academic potential would address the complex nature of the experience and fundamentally enhance understanding of the relations among these factors. This approach would be beneficial toward attaining the goal of facilitating student academic success.

Results of the present study show that readily available instruments assessing motivational orientation and perceptions of day-to-day experiences, when given and evaluated early in the academic term, provide some significant information regarding the likely behavior of a student in specific course. It seems obvious that early identification of potential problems, and the resultant application of appropriate interventions, would increase the likelihood of student short-term success in a given course, as well as enhancing their likelihood of success in future endeavors. Similarly, it might be appropriate to include these non-academic factors (e.g., procrastination, daily hassles), along with traditional predictors of academic performance (e.g., high school grade point average, ACT), in an effort to enhance predictability of academic performance. This suggests that research on academic performance and engagement should not only consider factors traditionally associated with success (e.g., motivational orientation, learning strategies), but also affective variables, such as a student's perceptions of daily events and tendencies toward procrastination. In addition, factors not presently considered may be more salient to a student's experience and therefore be more predictive of performance and engagement. These might include, but certainly are not limited to, optimism (e.g., Carver & Scheier, 2001), tendencies toward perfectionism (Frost et al., 1990), and perceptions of inclusion in the college community, as suggested by Tinto (1993).

The present findings also have important implications for faculty and administrative personnel attempting to understand the student experience. For instance, the results of the present study suggest that faculty should employ a multifaceted model when attempting to assess whether a student will be successful in a course. Such conceptions or preconceptions should not be made on the basis of academic information (e.g., grade point average, ACT scores) alone. Early assessment and evaluation of student

self-beliefs, either positive or negative, about their success in a course as well as their perceptions of the utility of the course as it applies to them, would be beneficial. The instructor would have insight about the student that would permit appropriate interventions to maximize student success. These interventions might take the form of tutorial practices, counseling, suggestions of alternative study and test-taking skills, and coping strategies. In this way faculty would be addressing skills as well as negative cognitions about self that often serve to maintain maladaptive behaviors. In addition, college administration might ascertain more affectively the potential success of new students by combining such information with what is presently assessed and found to be somewhat predictive of college aptitude (e.g., high school grade point average; criterion scores on standardized aptitude and achievement tests).

Directions for future research seem, as is human experience, multidimentional and multidirectional. Given the purposes of the present study and the results obtained, the following suggestions seem relevant.

To further investigate the relationships among the predictor variables, it would seem appropriate to replicate the present study using a larger sample. The use of a variety of samples should be considered, as would the use of a more appropriate statistical technique for analysis. This would include, but not be limited to, students at other academic institutions or across academic levels (i.e., class standing or years of college experience). Such investigation would contribute to a greater understanding of the problem.

Future research also should be directed toward exploring other student cognitions, behaviors, and perceptions that may contribute to understanding the complexity of the college student experience. In the present study, motivation, learning strategies, procrastination, and perceptions of daily hassles, as well as high school grade point average, were selected as predictors of group membership, given theoretical and empirical investigations that indicated that they were of particular importance. The results were somewhat disappointing, but nonetheless informative. Perhaps the instruments themselves were not appropriate in the present situation. Future research should be directed toward implementing, testing, and perhaps creating alternative instruments other than those chosen for the present study, to assess their validity and reliability to be

predictive of performance. In addition, future research should be directed toward determining if other cognitions, behaviors, and beliefs are more salient to the student experience. As previously discussed, other affective influences (e.g., dispositional optimism) may be more indicative of performance. Given the complexity of the college student experience, the possible combinations and permutations seem endless. However, if the effectiveness of assessing student potential can be enhanced, in keeping with the goal of increasing student academic success, the effort will be worth the expense.

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